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## SOME EFFECTS OF IMPROPER POSTURE IN FACTORY LABOR

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I approach any further discussion of the physical aspect of premature toil with a good deal of hesitation. In the first place, because I have discussed that matter before the conference on another occasion, and I have learned but little new since then, which puts me in a rather uncomfortable position. I feel, however, that I am in possession of the same data that I was before, and that they have not been changed, though perhaps my viewpoint has changed somewhat.

In the first place I think we should be careful not to lay too much stress on the physical changes wrought by child labor, because if child labor or premature employment resulted in no physical damage to the child's organism at all, we still should have ample room for absolutely and positively forbidding it. Therefore, we should not, I believe, put ourselves in the position of looking too closely to the matter of physical damage lest it appear that the argument against the employment of children rests upon the physical damage which is done to them. This is certainly not the case.

It seems to me that while the difficulties in the way of ideal conditions which are produced by family dependence and poverty must be recognized, it must also be acknowledged that it is a fatuous policy of the state to permit a minor to sacrifice during his years of possible physical development that which he cannot hope to regain or correct completely in his later years; to sacrifice a material portion of that practical efficiency which would otherwise be his and which he requires to give him that place in life to which he is by nature entitled.

I think that in any discussion of the physical effects of premature employment, it is unnecessary to discuss the effect of employment upon children younger than ten years of age. I believe that it is generally granted that children under ten years of age

ought not to have to work in factories for a living. It is likewise pretty generally acknowledged that such early employment cannot but result very unfortunately to these children physically.

On the other hand the important ages to study with reference to the physical effects of premature employment are the years between twelve and eighteen; the years of adolescence, that space of life about which there is some discussion with regard to legal enactment, concerning which there is some difference of opinion even among those who are interested in children and who are striving in their behalf; differences as to whether a child should be permitted to work at twelve or at fourteen or at sixteen.

During the period between twelve and eighteen years we have to deal with physical and mental changes in the individual which are of enormous importance, and which are recognized by everyone to be so physiologically; a period which is fraught with great dangers to the child, dangers mental, moral and physical; a period during which the child grows more rapidly in length than at any other time save that of early infancy; a period during which, because of the sexual development going on at this time, the child's nervous system is almost turned topsy-turvy. In many cases it is turned topsy-turvy and at this time the child is peculiarly open to external influences of both moral and physical character.

There is a vast difference between the work which a child's muscles do in factory employment and the work which that child will do if he is allowed to go freely as he chooses. A child between the ages of twelve and sixteen or eighteen years will, if given the opportunity, play and play hard. He will play baseball, play football, and he will use his muscles most energetically. He will take great delight in using his muscles in a gymnasium if he is given the opportunity. Therefore we are told by many who employ children or who would like to employ children at this age, that they are not using their muscles to any greater extent than they would use them if they were given simply that to do which they would choose to do, meaning thereby play.

Muscular exercise is beneficial. Exercise is our only means of strengthening the muscles, of encouraging their development, but the building up of a muscle which is actively growing and developing must be accomplished by exercises which are not too severe,

which are not too long continued and which are of constantly varying character.

Furthermore, the muscle which carries out exercises must be given frequent periods of rest, during which it may recover; it should be given an opportunity to build up again that which has been consumed by use.

What happens when a child is employed in a factory? The child is employed in a factory as rule in one of two ways; either in a standing or in a sitting occupation. Sometimes the character of the occupation is such as to combine the evil effects of both these positions.

Such a situation has been made clear to me in the illustration which Doctor McKelway gave with reference to the occupation of children at looms in the cotton mills. The child at the loom stands and sits at once, as it were, because he must stand in one place continuously for a long period of time in order to control the operation of the machine, and at the same time he must keep close to his work in order that this may be possible. Thus are combined the unfortunate effects of both sitting and standing.

That which is unfortunate in factory employment as far as purely physical effects upon the muscles are concerned, is the fact that a muscle must perform its functions for a long period of time without the opportunity of relaxing, without the opportunity of recovering. When a muscle has performed its function up to a certain point, we experience the sensation which we speak of commonly as fatigue. Fatigue means that there is an accumulation in the muscle of the waste products of its use, which have not yet been carried away and replaced by new material. If we continue to use a muscle far beyond the point of fatigue repeatedly, there results in that muscle in the course of time instead of further upbuilding, a degeneration and the result of such excess fatigue is the final weakening of a muscle which, if treated properly, would on the contrary grow stronger continuously. The result is that we find the children who are thus unable to change their position to relieve their over-tired muscles, taking peculiar positions which at first we call bad habits. We speak of the child that has round shoulders, for example, as habitually holding himself badly. Why does he hold himself badly? Simply because his muscles are not capable of holding him in a proper position, in what we call a

normal position. It is not a matter of slouchy habit of mind, either; it is a question of muscular weakness.

So with the child sitting at the machine, so with the child standing at the work bench continuously for periods varying from six to eight or nine hours a day. It is the lack of opportunity to relax, the lack of opportunity for these muscles to gain, within a reasonable length of time, what has been used up, which causes degeneration to take place, which causes this weakened condition to take place, and by reason of this weakened condition, certain postures which are abnormal and which will develop into deformity.

At a former conference of the National Child Labor Committee I strove to show how premature employment in standing positions tends to produce postural deformities of the feet; how sitting employment in young children tends to cause distortions of the spine and chest, and to what extent the conditions thus produced are likely to interfere with future industrial efficiency, as well as future health and chances for a normal tenure of life. It is not necessary to revert to these questions further at this time, but it seems well to mention them, and to call attention to the importance of the matters involved.

Consensus of opinion among medical men is that the period of adolescence is of critical importance for the individual, both mentally and physically. For me the physical condition of children has been of primary interest from a professional viewpoint. As before remarked, even if it could be shown that what we call premature toil was not injurious to the physical organism of the child, there would still be ample ground, both economic and humanitarian, why such employment should be forbidden.

Nevertheless it is highly important to seek definite information respecting the physical effect of such employment and for two reasons. The more important of these in my judgment concerns us the less in the purposes of this conference, since it advocates an investigation into the matter purely as a contribution to medical knowledge. As such a contribution, however, an inquiry of magnitude would assume great importance and would be likely to lend a determinative influence of great value to certain theories at present contending for proof, proof hitherto lacking because of the impossibility of carrying on an inquiry of such scope under private auspices.

It is held by some that the marked deformities of adolescence, such as lateral curvature of the spine and the severe deformities of the feet appearing at this time, cannot be produced by occupation or habit without the existence of structural weakness or disease of the bones of antecedent character. On the other hand, it is maintained that such deformities may result from overtaxing the muscular system alone, during this period when growth and development may be considered the principal functions of the body. If we could have such an investigation, it would be most important in its results, I am sure.

Whether deformities of children develop as the result of very unfortunate or improper employment, depends on a number of factors. Not every child who is employed too early in life or in an improper manner develops deformity. On the contrary, it is highly probable that a comparatively small proportion of them develops deformity. But in speaking of the physical effect of premature employment, we are not dealing with deformities alone, but with the damage to the child's general organism as well.

To begin with, children come to their employment with various abnormal conditions already existing. They come suffering from mal-nutrition as the result of insufficient or improper food at home. They come with the traces of former disease of the bones, such as rickets, and of tuberculosis and of inherited diseases. They come after having been employed to an excessive extent in their homes, or having been given improper work in their homes, or having been confined to their homes to an undue extent. These things, all of them, lead up to the postural deformities, which develop later during the course of their employment, and these deformities may be present and in formation when they come. However, this is to be remembered, that a spine which has started to become crooked, that has begun to weaken, and a chest which has not developed to the normal extent may be likened to a nail slightly bent. It may seem strong enough when you look at it, it may seem strong enough when you try to bend it with your fingers, but put it under the hammer and instead of going into the wood it bends still more. This is precisely what happens to these unfortunate children when they are placed in the unfavorable environment of factories and workshops, and at a time when their growth and development are not yet complete,

We have heard much of the influence of the school on the organism of the child. A great deal has been said and written on the subject. It is granted, I think, by schoolmasters everywhere and by others who have given the subject careful study, that the school very often has an exceedingly unfortunate influence on the physique of the child. It is said to be exceedingly important that the child should have the right kind of desk and the right kind of light. But remember that children in the poorest school are under no such unfortunate circumstances as the child is in the workshop or the factory. The child at school changes his occupation at least once an hour, during which time he has an opportunity of relaxing somewhat, or moving about. He has an interval usually in the midst of his tasks for some physical diversion. The hygienic conditions of even a poor school are much better, it seems to me, than the hygienic conditions in the best of workshops, so long as a child must spend nine or ten hours a day, or even eight hours a day, at work with only the lunch hour as an opportunity for diversion and relaxation.

A comparison of the agricultural child with the child in the factory or workshop has been made, and curiously enough it was a thing to which I had meant to give some consideration. It seems to me that the advantage is all upon the side of the child on the farm, even though he work ever so hard. I shall not go into the details of this question. They were very fully entered into just a few moments ago and much better than I could do, but I have this to say about this phase of the matter; that it is common knowledge that many of our most prominent men, not only a few, but a great many of them, have come from the farm, and they themselves have told us how hard they worked, how unfortunate were some of the conditions under which they worked. But these conditions seem to have done nothing more for these men than to give them a rugged physique and to give them opportunity for mental development which has enabled them to rise above their fellows.

Where are the graduates of the factories? I have not come across them in literature, science, art or politics. And I do not believe that they are there to be found to an extent at all considerable.

The whole question, however, of the physical effect of premature employment is more or less in doubt as regards exact information. We know or we think we know that such an environ-

ment as a child has in a workshop or a factory is capable of contributing at least very largely to the development of actual postural deformities, as we call them. We do not know how the occurrence or the danger of such deformities among such children will compare with the occurrence of the same deformities among children who do not work, because up to the present time no comprehensive investigation has been made in this country at all.

Therefore it is highly important that we should have such an investigation, and the purpose therefore of all I have stated is to show, not how much we know about the occurrence of physical deformities in factory children and children in other classes of work, but how much we do not know and how much we should know. Therefore it is a plea for the Children's Bureau.